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Your ref: Docket No. 52-006
Our ref: DCP_NRC_003122

February 10, 2011

Subject: Tier 2 Section 3.9 Editorial Corrections

This letter is being submitted in response to an NRC request to document minor editorial corrections in support of the AP1000 Design Certification Amendment Application (Docket No. 52-006). The information included in these responses is generic and is expected to apply to all COL applications referencing the AP1000 Design Certification and the AP1000 Design Certification Amendment Application.

Two wording changes for Tier 2 Section 3.9 are provided on the attached pages. For the comment on the skipped "even page numbers" in Table 3.9-16, please note that the DCD electronic version is set up so that it can be used to generate a printed copy. For the AP1000 DCD, Westinghouse uses the convention that all right hand pages have an odd page number in a printed volume, and as all 11x17 DCD pages are printed single sided, only odd page numbers are used on these pages. Further, we use the convention that back blank sides of 8 ½ x 11 pages have an even page number and a statement to the effect of intentionally left blank, whereas 11 x 17, foldout pages do not carry printing on their reverse sides.

Questions or requests for additional information related to the content and preparation of this response should be directed to Westinghouse. Please send copies of such questions or requests to the prospective applicants for combined licenses referencing the AP1000 Design Certification. A representative for each applicant is included on the cc: list of this letter.

Very truly yours,

S. E. Ritterbach for

R. F. Ziesing
Director, U.S. Licensing

/Enclosure

1. Markup of DCD Revision 18, Section 3.9

D063
NRO

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ENCLOSURE 1

Markup of DCD Revision 18, Section 3.9

3.9.6.2.2

position in accordance with ASME OM Code ISTC. The exercise test shows that the check valve opens in response to flow and closes when the flow is stopped. Sufficient flow is provided to fully open the check valve unless the maximum accident flows are not sufficient to fully open the check valve. During the exercise test, valve obturator position is verified by direct measurements using nonintrusive devices or by other positive means (i.e., changes in system pressure, temperature, flowrate, level, seat leakage, or nonintrusive tests results). The acceptance criteria for assessing individual valve performance will be based on full open (full disk lift or achieving design accident flowrates) and valve closure verification using differential pressure/backflow tests. Valves that cannot be checked using a flow test may use other means to exercise the valve to the open and closed position.

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Valves that normally operate at a frequency that satisfies the exercising requirement need not be additionally exercised, provided that the observations required of inservice testing are made and recorded at intervals no greater than that specified in this section.

The ASME Code specifies a quarterly valve exercise frequency. The AP1000 test frequencies are identified in Table 3.9-16. In some cases, check valves are tested on a less frequent basis because it is not practical to exercise the valve during plant operation. If quarterly exercise testing is not practicable, then exercise testing is performed during cold shutdown on a frequency not more often than quarterly. If this is not practical, the exercise testing is performed during each refueling outage. If exercise testing during a refueling outage is not practical, then another means is provided. Other means include nonintrusive diagnostic techniques or valve disassembly and inspection. The check valves included in the inservice testing program outlined in Table 3.9-16 do not require another means as an alternate to exercise testing based on the ASME OM Code used to develop the inservice testing plan for the AP1000 Design Certification.

Check Valve Low Differential Pressure Tests - Safety-related check valves that perform a safety-related mission to transfer open under low differential pressure conditions have periodic inservice testing to verify the capability of the valve to initiate flow.

The intent of this inservice test is to determine the pressure required to initiate flow. This differential pressure will verify that the valve will initiate flow at low differential pressure. This low pressure differential inservice test is performed in addition to exercise inservice tests. These tests are not required by ASME OM Code and are considered part of an augmented inspection program.

The specified frequency for this inservice test is once each refueling cycle.

Other Valve Inservice Tests

Explosively Actuated Valves - Explosively actuated valves are subject to periodic test firing of the explosive actuator charges. The inservice tests for these valves is specified in the ASME code. At least 20 percent of the charges installed in the plant in explosively actuated valves are fired and replaced at least once every 2 years. If a charge fails to fire, all charges with the same batch number are removed, discarded, and replaced with charges from a different batch. The firing of the explosive charge may be performed inside of the valve or outside of the valve in a test fixture.

18. This note applies to the CAS instrument air containment isolation valves (CAS-V014, V015). It is not practical to exercise these valves during power operation or cold shutdowns. Exercising the valves during these conditions may result in some air-operated valves inadvertently opening or closing, resulting in plant or system transients. These valves are exercised during refueling conditions when system and plant transients would not occur.

19. Primary sampling system containment isolation check valve (PSS-V024) is located inside containment and considerable effort is required to install test equipment and cap the discharge line. Exercise testing is not performed during cold shutdown operations for the same reasons. These valves are exercised during refueling conditions when the radiation levels are reduced.

20. This note applies to the main steam isolation valves and main feedwater isolation valves (SGS-V040A/B, V057A/B). The valves are not full stroke tested quarterly at power since full valve stroking will result in a plant transient during normal power operation. Therefore, these valves will be full stroke tested on a cold shutdown frequency basis. The full stroke testing will be a full "slow" closure operation. The large size and fast stroking nature of the valve makes it advantageous to limit the number of fast closure operations which the valve experiences. The timed slow closure supports the continued operability status of the valves in the intervals between fast closure tests and ensures that the valve is not mechanically bound.

21. Post-72 hour check valves that require temporary connections for inservice-testing are exercised every refueling outage. These valves require transport and installation of temporary test equipment and pressure/fluid supplies. Since the valves are normally used very infrequently, constructed of stainless steel, maintained in controlled environments, and of a simple design, there is little benefit in testing them more frequently. For example, valve PCS-V039 is a simple valve that is opened to provide the addition of water to the PCS post-72 hour from a temporary water supply. To exercise the valve, a temporary pump and water supply is connected using temporary pipe and fittings, and the flowrate is observed using a temporary flow measuring device to confirm valve operation.

22. Exercise testing of the auxiliary spray isolation valve (CVS-V084, V085) will result in an undesirable temperature transient on the pressurizer due to the actuation of auxiliary spray flow. Therefore, quarterly exercise testing will not be performed. Exercise testing will be performed during cold shutdowns.

23. Thermal relief check valves in the normal residual heat removal suction line (RNS-V003A/B) and the Chemical and Volume Control System makeup line (CVS-V100) are located inside containment. To exercise test these valves, entry to the containment is required and temporary connections made to gas supplies. Because of the radiation exposure and effort required, this test is not conducted during power operation or during cold shutdowns. Exercise testing is performed during refueling shutdowns.

24. Normal residual heat removal system reactor coolant isolation check valves (RNS-V015A/B, V017A/B) are not exercise tested quarterly. During normal power operation these valves isolate the high pressure RCS from the low pressure RNS. Opening during normal operation would require a pressure greater than the RCS normal pressure, which is not available. It would also subject the RCS connection to undesirable transients. These valves will be exercised during cold shutdowns.

25. This note applies to the main feedwater control valves (SGS-V250A/B), moisture separator reheater 2nd stage steam isolation valve (MSS-V015A/B), turbine control valves (MTS-V002A/B, V004A/B). The valves are not quarterly stroke tested since full stroke testing would result in a plant transient during power operation. Normal feedwater and turbine control operation provides a partial stroke confirmation of valve operability. The valves will be full stroke tested during cold shutdowns.

26. This note applies to containment compartment drain line check valves (SFS-V071, SFS-V072, WLS-V071A/B/C, WLS-V072A/B/C). These check valves are located inside containment and require temporary connections for exercise testing. Because of the radiation exposure and effort required, these valves are not exercised during power operation or during cold shutdowns. The valves will be exercised during refuelings.

27. Containment isolation valves leakage test frequency will be conducted in accordance with the "Primary Containment Leakage Rate Test Program" in accordance with 10 CFR 50 Appendix J. Refer to SSAR subsection 6.2.5.

28. This note applies to the chilled water system containment isolation valves (VWS-V058, V062, V082 and V086). Closing any of these valves stops the water flow to the containment fan coolers. This water flow may be necessary to maintain the containment air temperature within Technical Specification limits. As a result, quarterly exercise testing will be deferred when plant operating conditions and site climatic conditions would cause the containment air temperature to exceed this limit during testing.

29. Exercise testing of the turbine bypass control valves (MSS-V001, V002, V003, V004, V005 and V006) will result in an undesirable temperature transient on the turbine, condenser and other portions of the turbine bypass due to the actuation of bypass flow. Therefore, quarterly exercise testing will not be performed. Exercise testing will be performed during cold shutdowns.

30. This note applies to the passive residual heat removal heat exchanger discharge valves (PXS-V108A and V108B). Exercise and fail safe testing these valves on a 3-month frequency is not in the interest of plant safety due to the cooler water in the system line possibly creating a reactor transient. Opening these valves to the suction of the reactor coolant pumps aligns cold water to direct injection into the reactor core. Also, the thermal transient expected during this testing, on the discharge line, is expected to be severe due to the large temperature difference across the discharge valves. Quarterly IST will aggravate the thermal transient due to the operating temperature during the valve exercise testing and the number of times this thermal transient takes place. These valves will be full stroke exercise and fail safe tested during cold shutdown periods.

31. These valves are subject to operability testing per the requirements of 10 CFR 50.55a. The test frequencies are to be established in accordance with the results of the Joint Owners Group (JOG) program for periodic verification of design-basis capability of safety-related motor-operated valves (MOVs). Based on the composition of power-operated valves (POVs) in this table, the JOG approach shall be applied to all actuator types. POV risk ranking and functional margin are used to establish the recommended maximum periodic verification test (Operability) interval.

    These POVs (motor-operated, air-operated, solenoid-operated, and hydraulically-operated) shall be addressed in the owner's POV respective program-specific documents. Attributes of these programs shall include lessons learned as delineated in the NRC's Regulatory Issue Summary (RIS) 2000-3, "Resolution of Generic Safety Issue 158, Performance of Safety-Related Power-Operated Valves Under Design Basis Conditions." See subsection 3.9.6.2.2 for the factors to be considered in the evaluation of operability testing and subsection 3.9.8.4 for the Combined License information item.

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32. These valves are subject to leak testing to support the nonsafety-related classification of the CVS purification subsystem inside containment. These valves are not included in the PIV integrity Technical Specification 3.4.16. The leakage through valves CVS-V001, CVS-V002, and CVS-V080 will be tested separately with a leakage limit of 1.5 gpm for each valve. The leakage through valves CVS-V081, V082, V084, and V085 will be tested at the same time as a group with a leakage limit of 1 gpm for the group. The leak tests will be performed at reduced RCS pressures. The observed leakage at lower pressures can be assumed to be the leakage at the maximum pressure as long as the valve leakage is verified to diminish with increasing pressure differential. Verification that the valves have the characteristic of decreasing leakage with pressure may be provided with two tests at different test pressures. The test requirements including the minimum test pressure and the difference between the test pressures will be defined by the Combined License applicant in the inservice test program as discussed in subsection 3.9.8.

33. This note applies to valve FHS-V001. This valve closes one end of the fuel transfer tube. The fuel transfer tube is normally closed by a flange except during refuelings. This valve has an active safety function to close when the fuel transfer tube flange is removed and normal shutdown cooling is lost. Closing this valve, along with other actions, provides containment closure which allows long term core cooling to be provided by the PXS. As a result this valve is only required to be operable during refueling operations.

34. This note applies to the moisture separator reheater 2nd stage steam isolation valve (MSS-V015A/B), turbine control valves (MTS-V002A/B, V004A/B), main turbine stop valves (MTS-V001A/B, V003A/B), the turbine bypass control valves (MSS-V001, V002, V003, V004, V005, V006). These valves are not ASME Code Class 1, 2, or 3, and the ASME 1ST Category is indicated based on the valve functions listed. These valves are relied on in the safety analyses for those cases in which the rupture of the main steam or feedwater piping inside containment is the postulated initiating event. These valves are credited in single failure analysis to mitigate the event.

35. This note applies to the turbine stop valves (MTS-V001A/B, V003A/B). The valves are not quarterly stroke tested since full stroke testing would result in a plant transient during power operation. The valves will be full stroke tested during cold shutdowns. See Note 34 above.